



Earthworm populations in agroforestry systems and regenerating Atlantic forest fragments in the region of Barra do Turvo, São Paulo, Brazil

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Large areas of the Atlantic rainforest biome have been deforested in the past mainly for agricultural purposes, especially cattle ranching. However, many of these areas are currently underutilized or degraded by overgrazing. In the Ribeira River valley, soil degradation and extreme poverty have been major challenges to overcome in the development of improved agricultural systems that provide both food security and income to small farmers. Several government projects (e.g., Iguatu2, funded by Petrobras) and NGO's (e.g., Cooperafloresta, AOPA), have aided in the establishment of small farmer cooperatives, and in extending the adoption of agroforestry systems that help recover and conserve soil quality. The present work was undertaken to evaluate soil quality and macrofauna populations as bioindicators in agroforestry systems and regenerating secondary forest in the region of Barra do Turvo (São Paulo State) and Adrianópolis (Paraná State), in Southeastern Brazil. The present abstract presents results only of the earthworm community. Three agroforestry systems of different ages (4, 8 and 16 yr) and three forest fragments in different stages of regeneration (5, 20 and >30 yr) were chosen for this study. Earthworms were collected using the standard TSBF method (25 x 25 cm blocks to 20 cm depth) by taking two samples in each of three plots per treatment, for a total of 6 samples per treatment. Three earthworm species were found, all of them exotic or peregrine: *Pontoscolex corethrurus* (Müller, 1857), *Amyntas gracilis* (Kinberg, 1867) and an unidentified *Dichogaster* sp. *P. corethrurus* dominated, representing >90% of total density and biomass. A positive relationship between earthworm abundance and age of agroforestry systems was observed, especially for *P. corethrurus*. The opposite was found for the forests; a negative relationship between age of regeneration and earthworm abundance was observed. Highest abundances were recorded in the oldest agroforestry system (16 yr), and the youngest regenerating forest (5 yr); 459 and 733 individuals/m², respectively, although both sites had similar biomass, approx. 100 g/m². Therefore, agroforestry systems seem to benefit earthworm populations, while the regeneration process of secondary forests appears to have a negative effect. Reasons for this phenomenon are being further investigated.